



REL Appalachia Ask A REL Response

January 2020

Question:

What outcomes are associated with enrollment in Advanced Academic or Gifted and Talented programs in elementary and middle school?

Response:

Thank you for your request to our REL Reference Desk regarding evidence-based information about Advanced Academic or Gifted and Talented programs. Ask A REL is a collaborative reference desk service provided by the 10 Regional Educational Laboratories (RELs) that, by design, functions much in the same way as a technical reference library. Ask A REL provides references, referrals, and brief responses in the form of citations in response to questions about available education research.

Following an established REL Appalachia research protocol, we searched for peer-reviewed articles and other research reports on short- and long-term outcomes associated with Advanced Academic or Gifted and Talented programs. We focused on identifying resources that specifically addressed the effects of these programs in elementary and middle school. The sources included ERIC and other federally funded databases and organizations, research institutions, academic research databases, and general Internet search engines. For more details, please see the methods section at the end of this document.

The research team did not evaluate the quality of the resources provided in this response; we offer them only for your reference. Also, the search included the most commonly used research databases and search engines to produce the references presented here, but the references are not necessarily comprehensive, and other relevant references and resources may exist. References are listed in alphabetical order, not necessarily in order of relevance.

References

Adelson, J. L., McCoach, D. B., & Gavin, M. K. (2012). Examining the effects of gifted programming in mathematics and reading using the ECLS-K. *Gifted Child Quarterly*, 56(1), 25–39. Abstract retrieved from <https://eric.ed.gov/?id=EJ955651>; full text available at https://www.researchgate.net/profile/D_Betsy_Mccoach/publication/258137780_Examining_the_Effects_of_Gifted_Programming_in_Mathematics_and_Reading_Using_the_ECLS-K/links/00b49528e85d856717000000.pdf

From the abstract: “This study examined the average effects of schools’ third through fifth grade gifted programming policy in mathematics and reading on overall school achievement, on gifted students’ achievement and academic attitudes[,] and on nongifted students’ achievement and academic attitudes. Data and results represent a broad, national look at school personnel–reported programming without distinction as to type, length, or degree of programming. No detrimental effects were found at the overall school level or for nongifted students. However, the results also indicated that, on average, the diverse programs reported in the Early Childhood Longitudinal Study, Kindergarten Class of 1988–1989 (ECLS-K) database had no effect on gifted students’ achievement or academic attitudes. Considered in light of prior research indicating benefits of specific programs and existing inconsistent policies and programs, this suggests the need for future research to determine effective program characteristics and suggests that policy makers, educators, and parents actively must seek research-based practices to use with gifted children.”

Bolland, A. C., Besnoy, K. D., Tomek, S., & Bolland, J. M. (2019). The effects of academic giftedness and gender on developmental trajectories of hopelessness among students living in economically disadvantaged neighborhoods. *Gifted Child Quarterly*, 63(4), 225–242. Abstract retrieved from <https://eric.ed.gov/?id=EJ1228062>; full text available at https://www.researchgate.net/profile/Kevin_Besnoy/publication/332426113_The_Effects_of_Academic_Giftedness_and_Gender_on_Developmental_Trajectories_of_Hopelessness_Among_Students_Living_in_Economically_Disadvantaged_Neighborhoods/links/5cdc605f458515712eadcf73/The-Effects-of-Academic-Giftedness-and-Gender-on-Developmental-Trajectories-of-Hopelessness-Among-Students-Living-in-Economically-Disadvantaged-Neighborhoods.pdf

From the abstract: “Although there is much research on adolescent poverty, research related to youth living in communities characterized by extreme poverty who are also identified as academically gifted is lacking. This study explores the development of hopelessness in these youths, compared with peers not identified as gifted, using data from the Mobile Youth and Poverty Study. Specifically, trajectories of hopelessness as a function of gifted status and gender are explored. Results indicate that boys experience greater feelings of hopelessness than girls, regardless of their gifted status, and students identified as gifted have lower levels of hopelessness than their peers not identified as gifted. These latter differences are particularly pronounced during early adolescence (age 10 years) but decline over time and largely disappear by later adolescence (age 18 years). Results suggest that boys may be particularly vulnerable to declining effects of gifted classification as a

protector against hopelessness across age and that disadvantaged students who are identified as gifted may benefit from gifted programs that continue at an intense level through their high school years.”

Bui, S. A., Craig, S. G., & Imberman, S. A. (2011). *Is gifted education a bright idea? Assessing the impact of gifted and talented programs on achievement* (NBER Working Paper 17089). Cambridge, MA: National Bureau of Economic Research. Abstract retrieved from <https://eric.ed.gov/?id=ED520282>; full text available at <https://www.nber.org/papers/w17089.pdf>

From the abstract: “In this paper we determine how the receipt of gifted and talented (GT) services affects student outcomes. We identify the causal relationship by exploiting a discontinuity in eligibility requirements and find that for students on the margin there is no discernable impact on achievement even though peers improve substantially. We then use randomized lotteries to examine the impact of attending a GT magnet program relative to GT programs in other schools and find that, despite being exposed to higher quality teachers and peers that are one standard deviation higher achieving, only science achievement improves. We argue that these results are consistent with an invidious comparison model of peer effects offsetting other benefits. Evidence of large reductions in course grades and rank relative to peers in both regression discontinuity and lottery models are consistent with this explanation.”

Gavin, M. K., Casa, T. M., Adelson, J. L., Carroll, S. R., & Sheffield, L. J. (2009). The impact of advanced curriculum on the achievement of mathematically promising elementary students. *Gifted Child Quarterly*, 53(3), 188–202. Abstract retrieved from <https://eric.ed.gov/?id=EJ843534>; full text available at <http://maxwellgate.pbworks.com/w/file/fetch/49309629/GATEresearchDocImpactAdvancedCurriculumAchievementMathematicallyPromisingElementaryStudents.pdf>

From the abstract: “The primary aim of Project M³: Mentoring Mathematical Minds was to develop and field test advanced units for mathematically promising elementary students based on exemplary practices in gifted and mathematics education. This article describes the development of the units and reports on mathematics achievement results for students in Grades 3 to 5 from 11 urban and suburban schools after exposure to the curriculum. Data analyses indicate statistically significant differences favoring each of the experimental groups over the comparison group on the ITBS (Iowa Tests of Basic Skills) Concepts and Estimation Test and on Open-Response Assessments at all three grade levels. Furthermore, the effect sizes range from 0.29 to 0.59 on the ITBS Concepts and Estimation Scale and 0.69 to 0.97 on the Open-Response Assessments. These results indicate that these units, designed to address the needs of mathematically promising students, positively affected their achievement.”

Kettler, T. (2014). Critical thinking skills among elementary school students: Comparing identified gifted and general education student performance. *Gifted Child Quarterly*, 58(2), 127–136. Abstract retrieved from <https://eric.ed.gov/?id=EJ1020323>; full text available at <https://journals.sagepub.com/doi/abs/10.1177/0016986214522508>

From the abstract: “Education reform efforts, including the current adoption of Common Core State Standards, have increased attention to teaching critical thinking skills to all students. This study investigated the critical thinking skills of fourth-grade students from a school district in Texas, including 45 identified gifted students and 163 general education students. Identified gifted students outperformed general education students on both the Cornell Critical Thinking Test and the Test of Critical Thinking ($d = 1.52$ and $d = 1.36$, respectively). There was no evidence of main effects or interaction effects for gender in measures of critical thinking within these samples. Critical thinking scores of students in the three schools did not differ significantly, nor were differences in scores associated with length of exposure to the gifted education program. The association of higher ability with advanced critical thinking skills, but at the same time, the lack of evidence of an effect of the gifted education programs (which did not focus specifically on critical thinking skills) suggests that differentiation of curriculum and instruction for gifted or advanced learners might fruitfully include deliberate differentiation of instruction in this area.”

Smith, S., Kupczynski, L., Mundy, M. A., & Desiderio, M. F. (2017). An analysis of fifth grade gifted and talented student math and reading achievement in South Texas public schools. *Journal of Instructional Pedagogies*, 19. Retrieved from <https://eric.ed.gov/?id=EJ1158371>

From the abstract: “This study investigated the achievement of south Texas public school fifth graders participating in gifted and talented programming compared to the achievement of fifth graders not participating in gifted and talented classification in the area of math to determine if any differences exist. Student achievement of males and females and students identified for free/reduced or full price lunch participating in gifted and talented programs were also examined for differences in achievement levels. Data analysis results indicate that there are significant differences between students who participate in gifted education programs and those who do not. For all results, a negligible effect size was present, indicating the gifted education program had a minimal effect on the scores for the students participating in the program.”

Wai, J. (2015). Long-term effects of educational acceleration. In S. G. Assouline, N. Colangelo, J. VanTassel-Baska, & A. Lupkowski-Shoplik (Eds.), *A nation empowered: Evidence trumps the excuses holding back America's brightest students, Volume 2* (pp. 1–11). Iowa City, IA: Belin-Blank Center, College of Education, University of Iowa. Retrieved from https://www.researchgate.net/profile/Jonathan_Wai/publication/277403890_Long-term_effects_of_educational_acceleration/links/556a024908aec22683035cd7.pdf

From the abstract: “Educational intervention comes in many forms. Educational acceleration is an important class of interventions that comprise the appropriate educational dose for an individual. Dosage implies that one specific intervention may not be as relevant as the right mix, number, and intensity of educational interventions for any

given person. This chapter reviews findings from the Study of Mathematically Precocious Youth (SMPY), a longitudinal study of thousands of intellectually talented students followed for many decades to the present. The longterm educational-occupational impact and positive subjective impressions about educational acceleration from academically advanced participants reported in these studies supports the importance of educational acceleration and, more broadly, an appropriate educational dose. The longitudinal research findings reveal that an educational program designed to move students at a pace commensurate with their rate of learning is educationally appropriate and necessary. Exceptionally talented students benefit from accelerative learning opportunities, have few regrets about their acceleration, and demonstrate exceptional achievements. What matters for each student is a consistent and sufficient educational dose across a long span of time, what we think of as life-long learning, or learning at a pace and intensity that matches a student's individual needs. All students deserve to learn something new each day, and if academically talented students desire to be accelerated and are ready for it, the long-term evidence clearly supports the intervention."

Young, J. L., Young, J. R., & Ford, D. Y. (2017). Standing in the gaps: Examining the effects of early gifted education on black girl achievement in STEM. *Journal of Advanced Academics*, 28(4), 290–312. Abstract retrieved from <https://eric.ed.gov/?id=EJ1157355>; full article available at https://www.researchgate.net/profile/Jamaal_Young/publication/319862029_Standing_in_the_Gaps_Examining_the_Effects_of_Early_Gifted_Education_on_Black_Girl_Achievement_in_STEM/links/5c534a4a92851c22a39e4e81/Standing-in-the-Gaps-Examining-the-Effects-of-Early-Gifted-Education-on-Black-Girl-Achievement-in-STEM.pdf

From the abstract: "The purpose of this study was to explore the differential effects of access to gifted education on the mathematics and science achievement of fourth-grade Black girls. This study utilized mean difference effect sizes to examine the magnitude of differences between groups. By convention, White girls were included as a comparison group. Girls receiving gifted instruction and girls not receiving gifted instruction were the populations of interest ($N = 13,868$). The mathematics results suggest that Black girls participating in gifted education statistically significantly outperform Black girls in the comparison group. The mean difference effect sizes for within-group differences were almost twice as large for Black girls compared with White girls. The science results indicate that Black girls receiving gifted instruction outperformed Black girls in the comparison group. White girls, regardless of access to gifted instruction, statistically significantly outperformed Black girls in science. These results inform the recommendations provided."

Additional Ask A REL Responses to Consult

Ask A REL Appalachia at SRI International. (2018). *How does clustered grouping impact gifted and non-gifted student outcomes?* Retrieved from <https://ies.ed.gov/ncee/edlabs/regions/appalachia/askarel/aar38.asp>

Ask A REL Appalachia at SRI International. (2019). *How does a STEM (science, technology, engineering, and mathematics) or STEAM (science, technology, engineering, art, and mathematics) approach to gifted programs affect students' math or science outcomes and their attitudes about math and science?* Retrieved from <https://ies.ed.gov/ncee/edlabs/regions/appalachia/askarel/aar65.asp>

Ask A REL Mid-Atlantic at Mathematica. (2018). *What is the evidence to support differentiating instruction to meet the needs of gifted learners?* Retrieved from https://ies.ed.gov/ncee/edlabs/regions/midatlantic/askarel_70.asp

Ask A REL Midwest at American Institutes for Research. (2017). *What research is available on how to fund the identification of gifted students and gifted education services? Are there any publicly available resources describing state funding formulas for gifted education?* Retrieved from <https://ies.ed.gov/ncee/edlabs/regions/midwest/askarel/2017/gifted-education-funding.aspx>

Additional Organizations to Consult

National Association for Gifted Children: <https://www.nagc.org/>

From the website: "NAGC's mission is to support those who enhance the growth and development of gifted and talented children through education, advocacy, community building, and research. We aim to help parents and families, K–12 education professionals[,] including support service personnel, and members of the research and higher education community who work to help gifted and talented children as they strive to achieve their personal best and contribute to their communities."

National Center for Research on Gifted Education: <https://ncrge.uconn.edu/>

From the website: "With funding authorized through the Jacob K. Javits Gifted and Talented Students Education Act, the Institute of Education Sciences, U.S. Department of Education (PR/Award #R305C140018) launched the National Center for Research on Gifted Education at the University of Connecticut to address these issues. During the first three years (Phase 1), the Center examined the extent of gifted programming and student participation in three states; identifying districts and schools that showed high achievement growth rates among gifted students, including those from underserved groups; and exploring how these sites successfully identified, served, and retained students from underrepresented groups in gifted programs. The Exploratory Phase 1 work focused on identifying gifted and talented programs that had a strong commitment to identifying and serving students from underrepresented groups and that showed promise for improving student outcomes. In

Phase 2 (Year 4 and 5), we are examining the effect of attending dedicated gifted classes in core content areas on students' academic achievement in reading/language arts and mathematics in a large, ethnically, economically, and linguistically diverse urban school district by comparing the reading/language arts and mathematics achievement of gifted students in three different settings: schools offering a full-time gifted-only program with gifted classes in all subject areas, schools offering a part-time gifted-only program with gifted classes in mathematics, and schools offering a part-time gifted-only program with gifted classes in reading/language arts. The Center's work extends over a total of 5 years (approximately 3 years for Phase 1, and 2 years for Phase 2)."

National Society for the Gifted and Talented: <https://www.nsgt.org/>

From the website: "The National Society for the Gifted & Talented (NSGT) is a not-for-profit 501(c)(3) organization created to honor and nurture gifted and talented (G&T) children and youth. It is committed to acknowledging and supporting the needs of G&T children and youth by providing recognition of their significant academic and performance accomplishments and access to educational resources and advanced learning opportunities directly related to their interests and talent areas."

William & Mary School of Education, Center for Gifted Education:

<https://education.wm.edu/centers/cfge/>

From the website: "The Center for Gifted Education is a research and development center providing services to educators, policy makers, graduate students, researchers, and parents in support of the needs of gifted and talented individuals. Located in Williamsburg, Virginia, the Center has established an international reputation for excellence in research, curriculum development, and service. Several major grants, including funding from the Jacob K. Javits Gifted and Talented Students Education Act, have provided significant support for the work of the Center."

Methods

Keywords and Search Strings

The following keywords and search strings were used to search the reference databases and other sources:

- ("advanced academic" OR gifted OR talented OR "gifted and talented") AND (outcome* OR effect*)

Databases and Resources

We searched ERIC a free online library of more than 1.6 million citations of education research sponsored by the Institute of Education Sciences (IES), for relevant resources. Additionally, we searched the academic database ProQuest, Google Scholar, and the commercial search engine Google.

Reference Search and Selection Criteria

In reviewing resources, Reference Desk researchers consider—among other things—these four factors:

- Date of the publication: Searches cover information available within the last ten years, except in the case of nationally known seminal resources.
- Reference sources: IES, nationally funded, and certain other vetted sources known for strict attention to research protocols receive highest priority. Applicable resources must be publicly available online and in English.
- Methodology: The following methodological priorities/considerations guide the review and selection of the references: (a) study types—randomized controlled trials, quasi experiments, surveys, descriptive data analyses, literature reviews, policy briefs, etc., generally in this order; (b) target population, samples (representativeness of the target population, sample size, volunteered or randomly selected), study duration, etc.; (c) limitations, generalizability of the findings and conclusions, etc.
- Existing knowledge base: Vetted resources (e.g., peer-reviewed research journals) are the primary focus, but the research base is occasionally slim or nonexistent. In those cases, the best resources available may include, for example, reports, white papers, guides, reviews in non-peer-reviewed journals, newspaper articles, interviews with content specialists, and organization websites.

Resources included in this document were last accessed on January 3, 2020. URLs, descriptions, and content included here were current at that time.

This memorandum is one in a series of quick-turnaround responses to specific questions posed by education stakeholders in the Appalachia region (Kentucky, Tennessee, Virginia, and West Virginia), which is served by the Regional Educational Laboratory Appalachia (REL AP) at SRI International. This Ask A REL response was developed by REL AP under Contract ED-IES-17-C-0004 from the U.S. Department of Education, Institute of Education Sciences, administered by SRI International. The content does not necessarily reflect the views or policies of IES or the U.S. Department of Education, nor does mention of trade names, commercial products, or organizations imply endorsement by the U.S. government.